

Discipline	ARTIFICIAL INTELLIGENCE code: 46/47/48-3 summer semester	
Specialty	Computer Science and Technologies	
ECTS credits: 6	Form of assessment: exam	
Lecturer	Assoc. Prof. Milena Karova, PhD Room 205 TB Phone: +359 52 383 409 E-mail: mkarova@tu-varna.bg	
Department	Computer Science and Engineering	
Faculty	Faculty of Computing and Automation	

Learning objectives: The Artificial Intelligence (AI) course introduces the fundamental concepts of modern theory and provides knowledge about the practical use of some basic methods in real-world applications. The lectures cover topics, such as: Agents. Intelligent agents. Solving problems by searching. Planning. Logic. Logical agents. Making decisions in fuzzy / uncertain information. The probabilistic approach. Machine Learning theory. Training of probability models. Communication, perception, action. AI Tools. Applications (natural speech processing, emotional intelligence, robotics, data interpretation, expert systems, etc.), as well as Philosophy and Ethics of Artificial Intelligence. The laboratory exercises address the application of various discriminative and generative methods of machine learning, such as: Probabilistic Neural Networks (PNN), Support vector machines (SVM), Gaussian mixture models (GMMs), Hidden Markov models (HMMs), self-organizing architectures (SOM, LVQ), Bayes Networks, locally recurrent neural networks (LR PNN), convolutional neural networks (CNN), deep neural networks (DNN), hierarchical time memories (HTM), etc. Furthermore, students acquire knowledge about the principles used in regression analysis and numerical values prediction, and the importance of regression analysis. The key principles underlying the modern methods of optimization, incl. evolutionary and genetic methods, and their advantages and disadvantages to traditional gradient optimization methods are discussed. For that purpose, knowledge, and skills related to Python, MATLAB, and AIML programming languages are mastered. The knowledge acquired within the AI course supports the diploma thesis project as well as the professional profiling towards development of technology with elements of artificial intelligence.

CONTENTS:

Training Area	Hours lectures	Hours seminar exercises
Agents. Intelligent agents	2	2
Solving problems by searching	3	3
Planning	3	3
Logic. Logical agents	3	3
Making decisions in fuzzy / uncertain information	3	3
The probabilistic approach. Training of probability models	3	3
Machine Learning	3	3

Communication, perception, action	3	3
AI Tools and means	3	3
Applications (natural speech processing, emotional intelligence, robotics, data interpretation, expert systems, etc.)	2	2
Philosophy and Ethics of Artificial Intelligence	2	2
TOTAL: 60 h	30	30